High-Voltage and Low-Crossover Redox Flow Batteries for Economical and Efficient Electricity Storage (DE-AR0000346)

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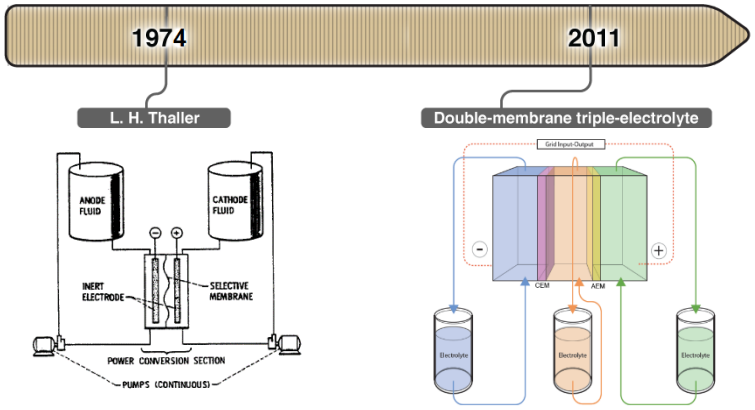
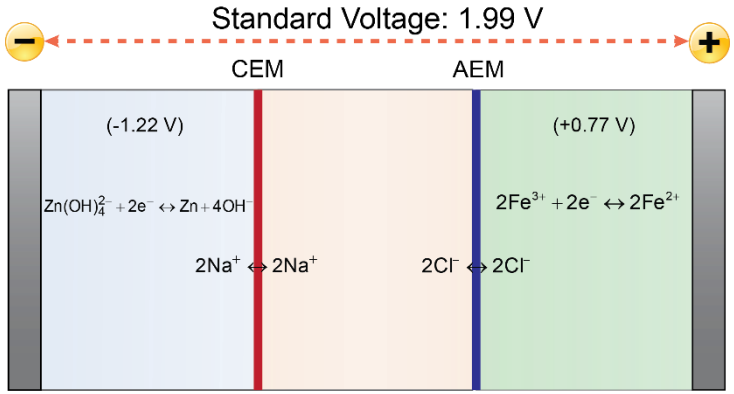
Double Membrane Redox Flow Battery (RFB)



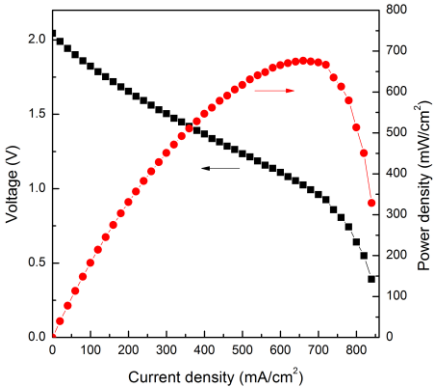
Benefit: Ability to combine cation and anion redox pairs, as well as acid and base electrolytes

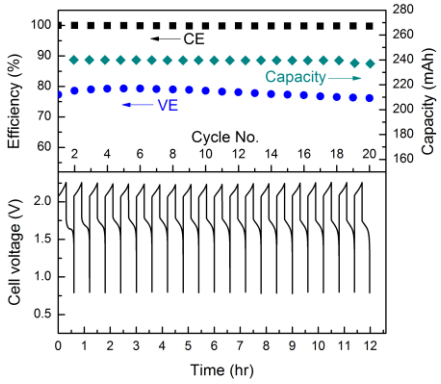
Most successful example: Zn-Fe RFB



Advantage: 1. High voltage; 2. Fast kinetics of both redox pairs; 3. Inexpensive redox pairs

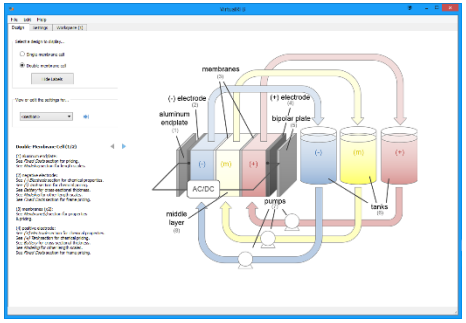
High performance

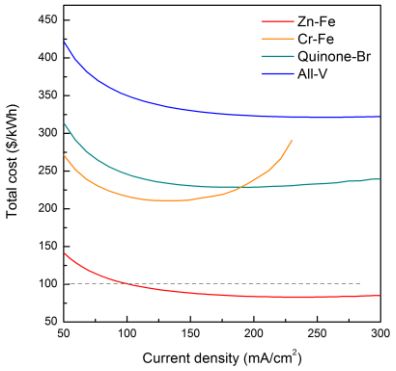




- **676 mW/cm^2** peak power density (left figure)
- 20 cycle test with **99.9% CE** and 98.3% capacity retention (right figure)

Low cost





- Custom-developed cost model (left figure)
- Zn-Fe has a cost **under $100/kWh** (right figure)